

DEFENSE INDUSTRIAL INITIATIVES CURRENT ISSUES

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“For innovation success,” wrote MIT researcher Michael Schrage, “do not follow the money.”¹ He argued that while we can easily measure inputs such as research and development (R&D) spending, outputs and outcomes, such as R&D productivity or customers won or retained, tell us much more about the ability to innovate successfully.

He’s right, of course. In 2007, European aerospace and defense companies spent relatively more on research and development and invested relatively more in capital equipment, according to a recent European study.² But this spending does not assure that future innovations will come from Europe. Higher R&D spending does not guarantee more creativity, higher profit or a greater market share.

The Data

The recent study, published as part of the EU’s ongoing Industrial Research & Innovation initiative, compares R&D spending in 2006-07 across EU countries and the rest of the world. It covers the top 1,000 EU companies and the top 1,000 non-EU companies in many industrial sectors, including aerospace and defense. The data is based on public financial statements and shows cash investment on R&D funded by the companies themselves, excluding contract work and shares of disclosed JVs and associated companies. The study allocates R&D by the country of the company doing it, not by where the R&D is performed.

¹ Michael Schrage, “[For Innovation Success, Do Not Follow The Money.](#)” *Financial Times*, November 7, 2005.

² [2008 EU Industrial R&D Investment Scoreboard](#), Joint Research Centre (JRC) and Research Directorate-General of the European Commission (DG RTD). Luxembourg, European Communities, October 2008.

Table 1: Key Financial Parameters for the Global Aerospace & Defense industry

Aerospace & Defense	#	€million (2007)				Capex*
		Cos.	Sales	Profit	R&D	
Europe	26	€126,391	€6,225	€8,094	€4,831	
US	18	197,219	21,530	6,558	4,572	
Rest of World	6	20,549	1,272	469	731	
Total	50	€344,159	€29,027	€15,121	€10,134	

Aerospace & Defense	#	As % of Sales			Sales / Employee (€000)
		Cos.	R&D	Profit	
Europe	26	6.4%	4.9%	3.8%	243
US	18	3.3	10.9	2.3	199
Rest of World	6	2.3	6.2	3.6	172
Wtd. Avg.	50	4.4%	8.4%	2.9%	211

**Capital Expenditures*

Source: 2008 EU Industrial R&D Investment Scoreboard, CSIS analysis

Observations

On the surface, the results paint a rosy picture for the EU. Table 1 shows that compared to companies elsewhere, on average European aerospace and defense companies spent more on R&D as a percent of sales in 2007 and had lower operating margins. They also spent invested more as a percent of sales and had higher R&D spending per employee.

However, a more in-depth analysis reveals that while European firms as a group made about €16 in sales per €1 spent on R&D, US companies made about €30 in sales per €1 spent on R&D, companies elsewhere made €14 in sales per €1 spent, and the industry as a whole made €23 in sales per €1 spent on R&D. Not surprisingly, therefore, while European companies are over-represented among the top 10 companies in R&D as a percentage of sales and capital expenditures as a percentage of sales, European and American companies are almost equally well-represented among aerospace and defense companies with more than €1 billion in annual sales (see Table 2).

Conclusions

European companies appear willing to sacrifice profitability in favor of higher R&D spending, compared to companies elsewhere. This implies one or more of the following:

European companies believe that more R&D spending will result in greater long-run returns;

They face tax codes and / or capital markets that favor R&D spending rather than profit maximization;

They face less pressure to earn a return on capital;

They believe that higher R&D spending will enable them to catch up to (or extend a lead on) companies elsewhere.

They spend a lot on R&D, but much of what they develop is not commercially useful. This would explain relatively high R&D expenses per employee, but low conversion of R&D spending into sales.

US companies, on the other hand, commercialize their R&D more effectively, getting more sales out of a given level of research investment (see Figure 1). This is consistent with relatively larger defense procurements; for US companies, investment in a new product is more likely to result in relatively larger sales. It is also consistent with the pressure to perform the capital markets place on US public companies. European companies may spend more seeking innovation, but American companies seem more likely to find and commercialize it.

- Matthew Zlatnik and Guy Ben-Ari

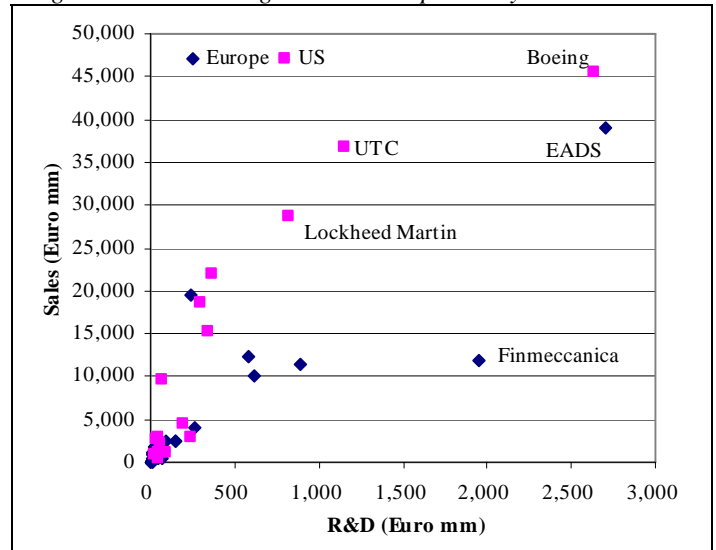
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Table 2: Top Aerospace & Defense Companies by Category and Region

Top 35 Aerospace & Defense Companies 2007 sales of €1bn and up			
Ranked by...	Companies in the...		
	<u>Top 10</u>	<u>Top 20</u>	<u>Top 35</u>
Sales			
Europe	3	7	16
US	6	11	15
Rest of World	1	2	4
R&D as % of Sales			
Europe	6	12	16
US	3	6	15
Rest of World	1	2	4
Capex* as % of Sales			
Europe	6	10	16
US	3	6	15
Rest of World	1	4	4
<i>*Capital Expenditures</i>			
Sales per Employee			
Europe	8	12	16
US	2	7	15
Rest of World	-	1	4

Source: 2008 EU Industrial R&D Investment Scoreboard, CSIS analysis

Figure 1: Selected Regions and Companies by Sales and R&D



Source: 2008 EU Industrial R&D Investment Scoreboard, CSIS analysis